AGRIFOOD
A LOOK AHEAD

ENVIRONMENTALLY FRIENDLY -
Opportunities and Challenges in the Agriculture and Food Sector

The Proceedings of the ninth annual Ontario Agricultural Outlook Conference

November 4 and 5
1991

Ontario Ministry of Agriculture and Food

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Policy and Programs Division
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FOREWORD

This document contains abstracts of presentations given at the Ministry of Agriculture and Food's 1991 Agri-Food: A Look Ahead Conference. The conference was held on November 4-5, 1991 and approximately 300 people attended.

This annual conference brings together members of all sectors of the agriculture and food industry and provides a forum to facilitate the discussion of relevant policy issues.

The 1991 theme was "Environmentally Friendly - Opportunities and Challenges in the Agriculture and Food Sector". Prominent speakers addressed this theme from various perspectives. Dr. Joseph Hulse, International Commission on the Application of Science to Agriculture, Forestry and Aquaculture, set the stage for the conference by discussing the world-wide trends relating to food, agriculture, and the environment. Dr. Clive Edwards, Ohio State University, provided an update on the research advances in environmental research with a special focus on nutrient management.

Ted Zettel, an ecological farmer from Ontario, provided practical insights into ecological farming.

The luncheon speaker was Richard Findlay of Ontario Round Table on Environment and Economy. Mr. Findlay discussed sustainable development initiatives in Ontario with particular reference to the Ontario Round Table on Environment and Economy.

After lunch, the focus of the conference shifted to the food industry. Presentations by Mary Lou Morgan of Origins Co-operative Inc., and Patrick Carson, Loblaw International Merchants, focused on several opportunities for niche marketing and the need for business to "think green".

The final speaker of the conference was Peter van Boheemen of The Ministry of Agriculture, The Netherlands. Mr. van Boheemen presented an international perspective on environmental issues. The presentation set out the environmental issues facing the Netherlands and how the country is coping with those environmental pressures.

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Environmentally Friendly - Opportunities and Challenges in the Agriculture and Food Sector

November 5, 1991
Delta Meadowvale Inn, Mississauga

INTRODUCTION

Chair:	**Kenneth Knox, Assistant Deputy Minister, Agriculture and Rural Services, OMAF**
9:00 - 9:10	**Bob Seguin, Executive Director, Policy and Programs Division, Introduction**
9:10 - 9:40	**Honourable Elmer Buchanan, Minister** *Welcoming Address*

AGRICULTURAL PERSPECTIVES

9:40 - 10:10	**Dr. Joseph Hulse, Chair, International Commission on the Application of Science to Agriculture, Forestry and Aquaculture** *Food, Agriculture and the Environment: A Global Context*
10:10 - 10:30	**Break**
10:30 - 11:00	**Dr. Clive Edwards, Professor, Ohio State University** *Advances in Environmental Research: Applications to Agriculture and Food*
11:00 - 11:30	**Ted Zettel, Farmer** *Making the Transition to an Environmentally Friendly Production System*
11.30 - 11:45	**Question Period**
11:45 - 1:30	**Lunch**
Speaker:	**Richard Findlay, Director, Ontario Round Table on Environment and Economy:** *Sustainable Development in Ontario*

FOOD'S PERSPECTIVE

Chair:	**Grahame Richards, Assistant Deputy Minister, Food Industry Division, OMAF**
1:30 - 2:00	**Mary Lou Morgan, Origins Co-operative Inc.** *Opportunities for Niche Marketing*
2:00 - 2:30	**Patrick Carson, Vice President for Environmental Affairs, Loblaws** *How Loblaws Addresses Environmental Challenges*

INTERNATIONAL PERSPECTIVE

2:30 - 3:00	**Peter van Boheemen, Ministry of Agriculture, The Netherlands** *Holland's Agricultural Policy: A Focus on Environmental Issues*
3:00 - 3:30	**Break**

SUMMARY - GRAYDON AB

3:30 - 4:30	**Question Period and Panel Discussion** *Moderator: Dr. Gary Hofstra, University of Guelph*
4:30 - 4:45	**Closing Remarks**
4:45 - 6:00	**Refreshments**

Introduction

The Honourable Elmer Buchanan
Minister of Agriculture and Food

I would like to begin our "Look Ahead" by reaching back to 1987 when the Brundtland Commission on the Environment and Development challenged all of us to begin looking at ways to meet our own needs without compromising the ability of future generations to meet their needs. This is what we are discussing today in our own province and in our own agricultural and food sector. The Brundtland Commission did not say to ignore your present needs and stop all progress or we won't have a future. Neither did it say we are doing a fine job now and the future is rosy if we stick to the status quo. Instead, the Commission made a plea to change our method of progress to find new ways of development that combines the goals of economic prosperity with environmental responsibility and social justice. As Ruth Grier, my colleague of the Ministry of the Environment puts it, we must move from a consumer society to a conserver society. The approach laid out by the Brundtland Commission is a good one for farmers and the food industry. It is essential that the agricultural community maintain and build on the image of farmers as stewards of the land and protectors of the natural environment.

However, in our agriculture and food system, there are certain immediate realities we must deal with. Our farmers, food processors and retailers are suffering under extreme, perhaps unprecedented economic pressures, low prices, international trade wars, cross border shopping, free trade and high cost of production, just to name a few of the problems. We must work together to build a stronger, more stable agriculture and food sector so that we can better weather the economic storms like the one we are experiencing now.

Environmental sustainability can be the foundation in which we rest that stronger, more stable sector. Two advantages to adopting the environmental sustainability practices come to mind immediately. First, they obviously ensure healthy soil, air, water and ecosystems. Without productive land we won't have an industry, whether it is economically weak or strong. And second, environmental sustainability practices can provide measurable financial savings either in the short or the long term. Environmental sustainability makes economic sense in the food industry as well.

There are a whole range of issues that must be considered in our drive towards sustainability. For example, any initiatives we take must not only consider the environmental impacts for food but also for surrounding environments, our streams, wetlands, forests and wildlife habitat. Any initiative must be well researched, planned and executed. Research should be conducted by multi-disciplinary teams to ensure that by altering the food production system we are not inadvertently damaging other natural systems. Costs and timing must also be figured into any environmental initiatives. In some cases, up-front costs may be too expensive and plans may

have to be delayed or altered. Measures that are imposed without carefully considering the economic security of farmers will produce abandoned fields and wasted communities. Finally, and perhaps most importantly, environmental actions must be taken cooperatively and with full consultation with the participants affected.

Here in Ontario we have good opportunities for farmers and others to provide input into environmental decisions. For example, I have established an Environmental Advisory Committee made up of 16 representatives of the farm and rural community to work with me in the directions we should take on environmental policies. We are about to begin a similar advisory process in the food industry. The Food Industry Environmental Forum will include representatives from the food processing and retail industries. This too will serve as a method for dispensing information to and gathering input from the people most affected by environmental initiatives. The cooperative approach extends to the Ontario Round Table on Environment and Economy.

In the Ontario agriculture and food sector we are making progress toward environmental sustainability. Many of our successes are directly related to the commitment and participation of farmers and farm organizations themselves. The Food Systems 2002 program targets a 50 percent reduction in pesticide use by the year 2002. In the Land Stewardship II program the Ontario Soil and Crop Improvement Association continues to do an excellent job delivering information, applications and advice to farmers. More than a quarter of all Ontario farmers are now practising conservation tillage techniques.

Many farmers, food processors and retailers are adopting environmental methods on their own because they make good sense environmentally and economically. There are many more measures we can take. First and foremost, we must see environmental responsibility as an integral part of our economic and social growth. In looking back at the Brundtland Commission's challenge, we can look with pride in the mirror at how far we have come and look with clarity of vision into a future of sustainable growth and prosperity.

The Honourable Elmer Buchanan is the Minister of Agriculture and Food, and the MPP for Hastings - Peterborough. He is a former educator and administrator with the local school board and has been involved in many rural development projects. Mr. Buchanan currently chairs the Cabinet Committee on Environmental Policy and is a member of the Ontario Round Table on Environment and Economy.

Food, Agriculture and the Environment: A Global Context

Dr. Joseph Hulse, Chair, International Commission on the Application of Science to Agriculture, Forestry and Aquaculture

There is a widening gap between food and other resources available to the rich and poor nations, the shrinking per capita resources available to produce food, and the appropriate action needed to deal with these problems.

Eighty-five percent of the world's arable soil is already in use. Therefore, expanded food production to meet the needs of the world's expanding population must come from better practices on and off the farm.

There is a pressing and persistent need to:

- increase crop yields and farm productivity in developing regions;
- protect and enhance the essential natural resource base (farm land, surface and ground water, genetic diversity);
- reclaim and restore fertility in lands lost through misuse;
- invest more resources in agricultural research and training, and in studies and development to integrate improved production with post-production systems and to stimulate rural agro-industrial employment; and
- devote more scientific resources to land capacity classification, to soil and water management research, and to determining land use that is economically productive and ecologically conserving.

Low input agriculture is not a viable option to deal with the need to increase food production. Soil-to-mouth subsistence agriculture cannot satisfy the needs of millions of people who live in urban and off-farm rural communities.

Improper use of pesticides and herbicides has caused damage to human health and to benign and beneficial organisms.

More effort is required to develop and prudently introduce sustainable agricultural systems, based on the rational management of physical, biological, socio-economic and human resources. An expanded research effort is required. The risks involved in moving from one set of practices to another must be dealt with.

Greater effort must be devoted to the improvement of food transportation, preservation, processing, distribution and utilization systems.

There is a continuing need to develop off-farm employment so that the non-farm population will have the means to purchase their food needs.

Dr. Hulse has worked on international sustainability issues in Rome and in Ottawa. He has also worked for a major food processing company in its research department. He was a member of the Brundtland Commission's Panel on Food Security, Agriculture, Forestry and Environment.

Advances in Environmental Research: Applications to Agriculture and Food

Dr. Clive A. Edwards
Ohio State University

Since the Second World War, U.S. agriculture has been concerned mainly with productivity and it has been very successful with yields tripling. However, this success has been achieved at considerable economic, sociological and environmental costs. Farm incomes have decreased, the use of agrochemicals has increased dramatically, often leading to decreases in food and water quality.

Unfortunately, the increased specialization in terms of separation of crop and animal production, and the trend towards growing crops in monoculture or biculture, has led to a dependence upon agrochemicals and to a declining ecological diversity. The overall number of farmers has dropped dramatically in recent years and a large proportion of them are now part-time farmers who need to supplement their incomes, because the returns from their crops and animals have been so low. Many argue that this trend has contributed significantly to the economic and cultural demise of rural America.

The concept of Integrated Pest Management (IPM) was originally developed in relation to insect pest control, detailed in the classic publication, The Integrated Control Concept (1959). This emphasized the blending of biological and chemical control measures. It was later broadened to refer to "a system which uses all suitable control methods in as compatible a manner as possible."

During the last 50 years there has been a progressive appreciation of the potential hazards of pesticides to wildlife, ecological processes and to human beings, either directly or through contamination of food and water. This led to studies of the ways in which these chemicals affect their target species. During the past twenty years these investigations have been extended to a much broader study of the overall ecological and environmental effects of pesticides.

These studies have led to the development of the concept of ecotoxicology which can be definedas: "Ecotoxicology is concerned with the toxic effects of chemical and physical agents on living organisms, especially on populations and communities within defined ecosystems; it includes the transfer pathways of those agents and their interactions with the environment."

The great expansion of research in ecotoxicology using these principles has greatly increased our ability to predict potential environmental hazards that newly developed pesticides might create. To achieve this we need to understand the chemical and physical properties of the pesticide, how it is metabolized, its probable fate in soil and water, and its effect on selected organisms. Such

data can be obtained from relatively simple laboratory studies without the need for a large number of expensive field studies.

Farming has moved progressively from a relatively diverse operation to a highly specialized and separate production of crops in monoculture or biculture and intensive, housed animal production. This has substituted machinery, chemicals, and technology for labour, land and rotations. Such industrialized systems can be operated by farmers with a minimal understanding of how they function. If we wish to reverse this trend it is essential to understand the function of agricultural ecosystems much better.

This has led to the relatively new discipline of agroecology which can be defined as: "Agroecology is the study of populations and communities of organisms in agricultural ecosystems and their role in the functioning of such systems." Applying ecological principles to understanding ecosystems concentrates attention on the complex interactions between the various natural and artificial inputs into agroecosystems and in the other components and ecological processes occurring within them.

Many people are worried about contamination of their food and water and are realizing that current high-input conventional agricultural practices cannot offer long-term sustainability. Agricultural scientists are turning their attention to the potential of a more sustainable agriculture which is based on lower chemical inputs used in integrated farming systems.

Lower-input sustainable agroecosystems rely much less on high inputs of energy and chemicals and much more on internal biological processes and cultural methods to achieve long-term productivity and environmental compatibility. By changing management and cropping practices to maximize nutrient and energy use efficiency, relatively high crop yields can be maintained at a much lower cost to both the farmer and the environment. Lower-input sustainable systems differ markedly from conventional, high-input agriculture in that the latter emphasize long-term goals such as maximum yields, at high costs to the environment. It is apparent that the goals of lower-input sustainable agriculture cannot be met by simply decreasing chemical inputs *per se*. Rather, successful low-input agroecosystems require informed management based on sound ecological and biological principles and a greater understanding of the complex interactions affecting agroecosystem productivity.

During the last decade major strides have been made in research and adoption of the principles of sustainable agriculture. Clearly, in the U.S. and world-wide there is a strong pressure to do research on an agriculture much less dependent on inorganic supplements.

Dr. Edwards has conducted research in a wide array of topics including: soil ecology; functioning of agroecosystems; persistence and fate of pesticides in soil; earthworm ecology; and lower-input/sustainable agriculture. He has had many consultant contracts in Asia, India, and South America and is the author of more than 200 scientific papers.

Making the Transition to an Environmentally Friendly Production System

Ted Zettel, Ecological Farmer, Ontario

Environmental crises are often dealt with as isolated problems and therefore "we see only bits and pieces of the real world."

Instead of developing temporary and independent solutions, it was proposed to use the model called the "farm organism." Under this model, the farming function is seen as a cycle of materials passing from the soil into crops, through livestock and manure and then back to the soil to complete the cycle. The ideals governing this model include limiting nature's contributions from sun, air and water and limiting losses from the system to food production.

The farm organism model was contrasted to modern agriculture which was described as the "industrial" model. Under this model, the farm is seen as a "manufacturing centre," where materials are brought in, changed into value-added form, and then shipped out again.

Optimism was expressed that many Ontario farmers could be persuaded to make the transition to the "farm organism" model. This would require an intensive education process to convince farmers that the switch to ecological farming is not a "move back to the horse and buggy days." Modern farming methods also need to be re-evaluated, something that successful farmers do on a continuous basis. It was stated that researchers, academics and policy makers must facilitate the transition to ecological farming, although "ecological expertise" should continue to be developed and communicated within the farm community.

Hopefully, farmers would make the transition to the "farm organism" model voluntarily, before they are forced to change through environmental legislation.

Mr. Zettel operates an ecological farm in central Ontario and is actively engaged as a lecturer and consultant on ecological farming.

Sustainable Development in Ontario

Richard Findlay, Executive Director
Ontario Round Table on Environment and Economy

Sustainable development means many different things to different people. The Brundtland Commission's definition is "satisfying the needs of our society without jeopardizing the prospects of future generations to meet their own needs." Another view is recognizing that the environment and the economy are interdependent - a strong economy depends on a healthy environment. Sustainable development occupies the middle path between these two, and represents the opportunity for mutual gain.

The Ontario Round Table on Environment and Economy is comprised of about 20 people from business, labour, academia, government and agriculture. It is not a government commission, but rather a forum for the facilitation of ideas on sustainable development from different sectors of society. Its goal is to integrate all areas of society, including agriculture and food, into a sustainable future. The round table idea is not restricted to Ontario. Every province and the federal government now have round tables.

The round table established a number of sectoral task forces (including one on Agriculture and Food) which made suggestions for achieving sustainable development in each sector. Six basic principles guide these task forces:

- prevent rather than cure (anticipate);
- full cost accounting or taking all the environmental costs into account;
- living on the environmental interest versus using up our environmental capital;
- learning to value quality over quantity;
- informed decision making based on integrated information; and
- respect for nature and the rights of future generations.

The idea of conservation implies efficiency in production which in turn implies greater competitiveness. Therefore, by conserving and adopting a sustainable form of production, producers should actually be able to gain a competitive advantage. In other words, the competitive position of Canadian farmers need not necessarily be adversely affected in this new sustainable vision.

Mr. Findlay is responsible for the activities of the Round Table on Environment and Economy. Previously, he worked for Environment Canada as Director, Analysis and Coordination. During the late 1970's, he developed the now-popular "Blue Box" curbside recycling approach.

Opportunities For Niche Marketing

Mary Lou Morgan, Origins Co-operative Inc.

During the two previous years, international standards for organic foods have been finalized. In the United States, organic farming has received considerable attention. A bill has been introduced in the House of Representatives which, if passed, will deal with definitional issues as well as standards in organic farming. In Canada, the Organic Unity Project, with representatives from all the provinces, is currently working with Agriculture Canada to define minimum national standards for organic food production, processing and distribution. The result of this effort would bring an end to the 25 different sets of standards currently sponsored by agencies in the Canadian agriculture and food system.

The issue of harmonizing standards and certification practices if not resolved soon, may become even more difficult and costly to resolve in the future because of the growing volume of food which is grown organically. The Ontario chapter of the Organic Crop Improvement Association (OCIA) certified produce from 17,000 acres in 1991, representing a threefold increase in acreage since 1988.

Organic farming does not guarantee food safety although organic farmers believe that their product may be more healthy than food produced using current commercial production practices. Organic farming practices support the idea of sustainable development and has the least impact on the environment. The value of sustainable agricultural and social practices is shared by the producers and consumers of organic foods.

The consumer should be the focus of the actions of the participants in the agriculture and food system. The organic (or alternative) food supply system has not been as successful as the conventional food system because of the lack of funds to conduct in-depth market research to identify and encourage consumption of organically produced foods. The market could be large if one notes that the total sales of organic foods in the U.S. was $1 billion in 1990. In Canada, total sales, according to Statistics Canada, was $76 million.

Ms. Morgan is currently involved with Origins Co-operative Inc., which was the first federally incorporated worker co-operative. The company develops and markets organically-grown food products. Ms. Morgan has worked in organic marketing for the past 21 years, and is the founding member of "The Big Carrot," a large natural food supermarket in Toronto.

How Loblaws Addresses Environmental Change

Patrick Carson, Vice-President of Environmental Affairs,
Loblaw International Merchants

Environment issues in a global context encompass global warming, ozone depletion, acid rain, garbage accumulation, biotechnology, soil erosion, and desertification. Rather than viewing these as problems, they should be looked at as opportunities awaiting solutions.

Industry does not really understand that as one nation becomes wealthy, another becomes poor. It does not understand that in order to survive, more level playing fields will have to be created around the world. Looking back historically, the world thought it had come further in the last 250 years of the industrial revolution, than the previous 5000 years. Also, there has probably been more damage done in the last 250 years than the previous 5000 years, and yet our economic indicators have led us into a very false sense of security. Society has been living off the capital, and not the interest. Since the industrial revolution, society's capital has decreased, and consequently so has the interest.

Loblaw has spent $10 million in research and development on its G.R.E.E.N. products. While not totally attributed to these products, the firm has experienced a 2 percent rise in market share, and a stock increase from $10.50 to $21 in a thirty month period. Even with these significant economic improvements, the greatest growth occurred in the company's employees. Staff members have bought into the concept, and felt proud to be associated with a company that was at least trying to do the right thing for the right reason.

While G.R.E.E.N. products are only a minor step, they have at least succeeded in creating an environmental consciousness at Loblaws. This consciousness is not a trend, nor simply an environmental shift. It is a social shift, and it is appearing in the different standards of children today, and in the university students. Society has moved away from the hippies and the NIMBYs (Not In My Backyard), to a new group which is described as the HICCs. A HICC is a Higher Inner Conscious Consumer, and will use their purchasing dollars to demonstrate their displeasure with social practices. A major marketing and business opportunity exists to serve this group that has environmental concerns.

Mr. Carson joined Loblaw Companies in 1975 and has held various senior executive positions in the areas of corporate development and strategic planning. He is co-author of "Green is Gold - Business in the Environmental Revolution."

Holland's Agricultural Policy: A Focus On Environmental Issues

Peter van Boheemen, Ministry of Agriculture, The Netherlands

In 1989, the Dutch government passed a National Environmental Policy Plan (NEPP) with a preference for sustainable development. A strategy has been formulated to gain control and to solve environmental problems within one generation. The NEPP recognizes that problems also occur on a global scale (climate change, ozone layer), a continental scale (acidification) and at the level of river basins (eutrophication).

To prevent environmental problems being passed on to future generations, the NEPP develops two routes for feedback: effect-oriented and source-oriented. The first requires the definition of maximum allowable emissions or waste flows and can be seen as feedback aimed at reducing risks to a negligible level. The second route of feedback leads to: emission-oriented measures; volume-oriented measures; and structure-oriented measures. Source-oriented measures are preferred to effect-oriented because the possibility of control is greatest at the source.

In the Netherlands, some 60 percent of the production value originates from livestock and poultry, 30 percent from horticulture and 9 percent from field crops. The area of agricultural land amounts to 2 million hectares of which 55 percent is grassland, 40 percent crop land and 5 percent horticultural land. Among the livestock, there are 1.9 million dairy cows, 1.7 million sheep, 14 million pigs, 44 million laying hens and 41 million broilers. To feed this livestock, high levels of nitrogen are used on grassland. In field crop and horticultural farming a high fertilizer input is combined with high levels of pesticides.

The NEPP distinguishes ten environmental themes. Among them, there are acidification, eutrophication, dispersion of toxic substances, climate change and waste disposal. Individual farmers must become aware that the limits of the environment must be respected and environmental measures will bring them something in return. Eventually, the interest of agriculture, environment and nature must be served equally.

Heavy metals (copper, zinc and cadmium) have accumulated in soils receiving heavy applications of poultry and pig manure. The remedy has been to reduce the levels of these metals in the feed concentrates fed to pigs and poultry.

Phosphorus and nitrogen are causing problems in groundwater (nitrate), acidification (evaporation of ammonia) and eutrophication (algae growth). Phosphorus and nitrogen balance sheets for individual farms can be drawn up to measure the amount of land required for the livestock. It is the intent to have a balance on each farm for nitrogen and phosphorus by the year 2000. This implies significant reductions in total production of manure or recycling it.

Since 1984, a coherent system of regulations has been introduced to control and eliminate environmental problems. These regulations are based on the Manures and Fertilizers Act, the Soil Protection Act and the Nuisance Act.

A specific regulation is an expansion ban whereby farms with a manure surplus are forbidden to increase animal numbers and phosphorus production above 1986 levels. Thus, a manure production quota has been introduced. Farmers with a manure surplus have to keep records on manure production and to prove disposal of their surplus by certificates of delivery.

In 1995, farmers with a manure surplus will be required to have contracts with manure users or processors. If such a plan is not adequate, part of their manure production will be taken away and consequently their livestock numbers have to be reduced.

The large-scale use of pesticides has endangered the quality of the environment and nature. Pesticides are applied at the rate of 10 kg active ingredients per hectare of cultivated land. There is concern about the health of consumers and of those who apply pesticides.

From an agricultural viewpoint there is also ample reason for reducing the pesticide use. Substances appear to be losing their effectiveness, resistance problems are increasing and degradation of pesticides by micro-organisms is accelerating.

In comparison with the current level the total pesticides, used is to be reduced by more than 35 percent in 1995, and by at least 50 percent in 2000. The largest reduction has to occur in surface water pollution.

The Pesticides Act regulates the trade and use of pesticides. In the future only pesticides meeting certain criteria for persistence, vulnerability to leaching and aquatoxicity will be approved.

The Pesticides Act will also provide for rules regarding the distribution of soil disinfectants by prescription only and the introduction of certificates of competence for pesticide application, a levy system, and a supply and use registration.

Mr. van Boheemen is currently the Head of the Division for Animal Husbandry and Environment, The Netherlands. He has worked on several task teams, including the National Commission on Manure Application, and the National Commission on Nitrogen in Agriculture.